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ADP013466

TITLE: Weaponization and delivery of Chemical and Biological Agents: A Terrorism Perspective

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TITLE: Chemical and Biological Medical Treatment Symposium - Industry II World Congress on Chemical and Biological Terrorism

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ADP013371 thru ADP013468

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97. WEAPONIZATION AND DELIVERY OF CHEMICAL AND BIOLOGICAL AGENTS: A TERRORISM PERSPECTIVE

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INTRODUCTION

An appreciation of the techniques that have been employed to disseminate chemical and biological agents in non-military incidents is relevant to a variety of policy and planning issues including the following:

- Prioritization of R&D funds earmarked for agent detection
- Exercise scenario development
- Development of symptom recognition guides
- Agent contamination and decontamination plans

GOALS OF THIS RESEARCH:

1. Facilitate our understanding of the dissemination and delivery of CB agents in non-military incidents.
2. Determine the relationship between dissemination technique and incident outcome.

DATA SOURCE

All data were acquired from open sources including newspapers, magazines, books, transcripts of radio and television broadcasts and reports prepared by various organizations.

ANALYTICAL METHODOLOGY:

1. Data describing 233 incidents of the actual or apparent use of CB agents in non-military incidents were analyzed to determine the means of dissemination and delivery used.
2. Cluster analysis was used to reduce the preliminary findings to a simplified topology of dissemination techniques.
3. Incident data were coded using the dissemination topology criteria and compiled in the CABO Database.
4. Tables were prepared using PSG's Incident Analysis Tool to facilitate analysis of the relationship between dissemination techniques, agent and incident outcome.

Table1: Determination of a dissemination typology by cluster analysis

Preliminary Findings Regarding Dissemination	→	Clustering by Route of Absorption	→	Simplified Typology
Animals		Inhalation		
		Particle Clouds	→	Aerosols
Consumable Products		Sprays		
		Gases	→	Vapors
Food and Drink		Splash		
		Ingestion		
Gases		Food & Drink		
Non-Consumable Products		Consumable	→	Contaminated Consumables
		Products		
Particle Clouds		Reservoirs		
		Injection		
Projectiles		Projectiles	→	Injection
		Syringes		
Reservoirs				
		Dermal Effects (or Transport)		
Splash		Non-Consumable	→	Contaminated Non-Consumables
Spray		Products		
Syringe				
		Animal Bites		
Unknown		Animal	→	Vectors
		Unknown	→	Unknown

Table 2: Findings on the relationship between dissemination technique and agent

DISSEMINATION TECHNIQUE	BIOLOGICAL	CHEMICAL	UNKNOWN	TOTAL
AEROSOL	8	13	1	22
VAPOR	-	64	0	64
CONTAMINATED CONSUMABLE	4	98	8	110
CONTAMINATED NON-CONSUMABLE	2	8	0	10
INJECTION	3	4	0	7
VECTOR	4	0	0	4
UNKNOWN	3	3	10	16
TOTALS	24	190	19	233

AEROSOLS:

Dissemination of the CB material via small droplets or particles suspended in the air.

VAPORS:

Dissemination of the CB material as a gas at prevailing weather conditions.

CONTAMINATED CONSUMABLES:

Dissemination of the CB agent by deliberately adding it to foods, water or other beverage or other consumable product, including medications.

CONTAMINATED NON-CONSUMABLES:

Dissemination of the CB agent by placing it on or within an item other than a consumable, e.g., clothing.

INJECTION:

Dissemination of the CB agent by direct injection into the target via a needle and syringe (or equivalent), or contaminated dart, ball or bullet.

VECTORS:

Dissemination of the CB agent by deliberate use of some animal carrier, including insect pests.

UNKNOWN:

Source material provided insufficient information to permit the determination or estimation of the dissemination technique.

Table 3: Findings on the relationship between dissemination technique and incident outcome

DISSEMINATION TECHNIQUE	FAILURE	PARTIAL SUCCESS	SUCCESS	UNKNOWN	TOTAL
AEROSOL	0	10	11	1	22
VAPOR	2	1	61	0	64
CONTAMINATE D CONSUMABLE	1	56	53	0	110
CONTAMINATE D NON- CONSUMABLE	0	5	5	0	10
INJECTION	0	1	6	0	7
VECTOR	1	1	2	0	4
UNKNOWN	0	0	14	2	16
TOTALS	4	74	152	3	233

SUCCESS:

Target was exposed to the CB agent and reacted to it.

PARTIAL SUCCESS:

CB agent was disseminated but the target either was not exposed or did not react.

FAILURE:

CB agent was not successfully disseminated.

UNKNOWN:

Source material provided insufficient information to permit the determination or estimation of the success.

CONCLUSIONS REGARDING DISSEMINATION TECHNIQUES

1. Contaminated consumables were the most frequently employed technique (47%).
2. Techniques that facilitated inhalation of the agent were used in 37% of the incidents.
3. Techniques that disseminated the agent as a vapor (27%) were attempted approximately three times as often as techniques that aerosolized (9%) the agent.
4. Biologicals (33%) were disseminated more often as aerosols than were chemicals (8%).
5. The threshold for apparent success was met in 65% of the incidents.
6. Only 2% of the incidents were apparent failures.
7. Incidents where the agent was released as a vapor were the most successful (95%).
8. Incidents involving vectors were the most likely to fail (25%).